PLANT SYMBIOSIS BY GEORGE D. SCOTT. The Institute of Biology's Studies in Biology No. 16. Edward Arnold (Publishers) Ltd., London. 1969. 58 pp. figs. 15 + 6 plates. 14s. (U.K.)

This book opens with a most valuable and clear statement of the nature of symbiosis, followed by a thought-provoking discussion of the possible origin of symbiotic associations. The morphological aspects of a very wide range of symbiotic systems, many of which may hitherto be unfamiliar to the non-specialist reader, are then described. Particular mention should be made of the masterly summary of the biology of lichens, as well as the concise and up to date description of mycorrhiza and nitrogen-fixing nodules. One of the most useful features of the book is the analysis of physiological integration which occupies chapter 4. Throughout, the emphasis is on general physiological principles, although with adequate reference to named examples. In this, and especially in the final chapter, the broader implications with respect to evolution, ecology and possible utilisation are kept well to the fore.

Plant Symbiosis can be unreservedly recommended. Nowhere else is this topic discussed in such a comprehensive yet attractive and easily digestible form. This book is of particular interest to readers in Southern Africa insofar as Dr. George Scott is a member of the Botany Department of the University College of Rhodesia, Salisbury, and makes several references to examples drawn from the region. Moreover this book provides a stimulus to the further study of our own symbionts, which whether from a systematic, ecological or physiological point of view, have been woefully neglected.

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DEVELOPMENTAL PLANT ANATOMY BY ALAN R. GEMMELL. The Institute of Biology's Studies in Biology No. 15. Edward Arnold (Publishers) Ltd., London, 1969. 60 pp. figs. 25 + 12 plates. 14s (U.K.)

The series, sponsored by the Biological Education Committee set up by the Royal Society and the Institute of Biology, is intended to deal with "topics in which recent progress has been most rapid and important" and to enable students to "be contemporary in their biological outlook". This book does neither. It is in fact a highly condensed course in elementary anatomy, with conventional subject treatment which does not come up to the standard of that in many currently available textbooks of general botany.

Because of its low price and outwardly attractive format, this book will undoubtedly fall into the hands of students and for this reason it is necessary to point out some of the inaccuracies and examples of gross carelessness which abound on nearly every page. Thus we have "lignin thickening", "border pits", "annular protoxylem", "dicot. leaf" and in figure 3-1, in which a vascular bundle is illustrated, "A rough diagram of part of a transection of sunflower". The general standard of photomicrographs and line drawings, and their captions, is very low. Figure 2-2, a "diagram of longisection of top of procambial strand" and figure 4-2, of the vascular cambium and its products, will certainly mislead students. The vermiform object in figure 5-3 is labelled a "tracheid or xylem fibre"!

A most ambiguous discussion on the first page might lead the reader to suppose that the mycelium of *Mucor* consisted of a chain of cells, and the advisability of referring to the hyphal tip as a meristem may be disputed. We are told that "it is not easy to see definite apical cells and in consequence descriptions of the plant apex have fallen into three main categories". The account which follows, which includes a discussion of the histogen theory, is confusing in a book at this level, especially as it leads to the statement that the epidermis is derived from "the outermost layer of the tunica, or the dermatogen, or the protoderm or the mantle layer". There is an unnecessarily long and obscure discourse on the arithmetical complexities of phyllotaxy, which is not well integrated with the structure of the apex.

The description of the mode of action of the vascular cambium is outdated and it is no correct to describe the ray initials as isodiametric. There seems to be some ambiguity in "unseriate homogeneous rays are primitive and the multiseriate heterogeneous condition is a derived state, e.g. Pine compared with Oak or Beech". One might still tolerate that laboured distinction between "spring" and "summer" wood, were it not for the fact that the student is encouraged to examine some tropical timbers, "cut with a razor blade or sharp knife".

The section on flowers and fruits comprises some rather diffuse physiology and very little anatomy. It does however include the following gem: "many fruits are grown in the tropics and transported to the markets where they are sold". The reader is expected to be familiar with gibberellins, kinins, lysozyme, phytochrome, mitochondria and ribosomes but not with the basic features of a flower. He apparently needs also to be instructed that a fruit, in botanical parlance, is not necessarily tasty and juicy. Following a similar line of thought, if there is adequate background for the discussion of the action of ATP, IAA and DNA, then surely one can be more explicit than still to talk about "pectic substances" and "hemicelluloses".

The possible relationships between structure and function, as well as phyllogenetic problems, are throughout dealt with in a superficial and facile manner, certainly belying any claim to an exposition of contemporary thought.

This book is little credit to its author or sponsors and, as recommended in the preface, some of us will certainly be "discussing the difficulties and significance of it with the class".

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